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Richard J. Lloyd
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A STUDY OF NATA CERTIFICATION CANDIDATES' PERCEPTION OF PREPARATION BEFORE AND AFTER TAKING THE CERTIFICATION EXAM

RICHARD J. LLOYD

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A Study of NATA Certification Candidates' Perception of Preparation Before and After Taking the Certification Exam

(TITLE)

BY

Richard J. Lloyd

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Science

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1981
YEAR

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A Study of NATA Certification Candidates' Perception of Preparation Before and After Taking the Certification Exam

By

Richard J. Lloyd

ABSTRACT OF A THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Science in the
Graduate School of Eastern Illinois University

Charleston, Illinois

1981

410502

A Study of NATA Certification Candidates' Perception of Preparation Before and After Taking the Certification Exam

ABSTRACT

This study was designed to determine if there was a difference in how 140 National Athletic Trainer's Association certification candidates felt they were prepared for the nine subject areas after the test, in comparison to their feelings of preparation before taking the test.

The seventeen item questionnaire used to collect data for this study was sent to 200 NATA certification candidates who had taken the NATA certification exam on March 15, 1981. The data were analyzed by the t-test at the .05 level of significance. The calculations were completed by using the Statistical Program for Social Sciences (S.P.S.S.) on the IBM computer at Eastern Illinois University.

Results of this study indicated that all certification candidates felt less prepared in the subject areas of Anatomy, Kinesiology, Physiology of Exercise and First Aid Procedures after taking the test. Female candidates did not show any change in perception in preparation after the test in the areas of Injury Recognition, Therapeutic Modalities and Supportive Taping and Bandaging Techniques. The Apprencticeship and Approved Curriculum program candidates

perceived no change in preparation after taking the test in the areas of Therapeutic Exercise and Therapeutic Modalities, respectively. Male candidates felt less prepared after the test in all nine subject areas.

ACKNOWLEDGMENTS

The author would like to express sincere gratitude to several people who made contributions to this project. First, to Mr. Paul Grace, Chairman of the National Athletic Trainer's Association Board of Certification for supplying the names and addresses of the candidates taking the certification exam. Secondly, to Dr. William Buckellew, for his experience and guidance in the final stages of this paper.

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Chapter 1

INTRODUCTION

Qualifying to become a National Athletic Trainer's Association (NATA) Certified Trainer requires the candidate to successfully pass the Written and Oral/Practical sections of the NATA certification exam. Before the candidates are eligible to take the exam, they must meet several requirements, depending upon which classification they pursue. These requirements are described in the NATA Procedures for Certification that accompanies the test application booklet (See Appendix A).

When the candidates have mastered the requirements they make application to the NATA Board of Certification to take the certification exam. This requires a fee of $80.00. If the Board of Certification accepts their application, they are sent notification of the date and site the exam will be administered.

The exam consists of a written section totaling 150 multiple choice type questions and an oral/practical section. During the oral/practical section the candidates are asked to perform several skills for which they must be proficient to become certified. The candidates have a total of four hours to complete the written and oral/practical sections of the exam.

Purpose of the Study

The purpose of this study was to determine how well certification candidates felt they were prepared to take the NATA certification exam before and after taking the certification exam. The study also intended to assess whether there were perceived differences in the level of preparedness in the nine subject areas by classification.

Need for the Study

The knowledge and subject areas required of athletic trainers is very diverse. While preparing students to become certified athletic trainers it may be possible that some important learning can unknowingly be omitted. One or more subject areas may not be emphasized to the extent necessary to qualify a student to become a certified athletic trainer.

The information contained in the study may be helpful to student athletic trainer instructors, student trainers, and approved curriculum directors to perceive the preparedness of their program's certification candidates.

Limitations of the Study

Certain factors had a limiting effect on this study. At the time the surveys were printed it was estimated that 200 copies would be sufficient for completing the study. The questionnaire had to be printed and approved by the NATA

Board of Certification prior to the date of the NATA certification exam. When the list of the candidate's names and addresses were obtained it was found that 211 surveys were needed. Because reprinting was not possible, eleven candidates were not included in the study.

The original intent of the study was to include the four certification qualifying classifications. However, due to the lack of responses in the Special Consideration and Physical Therapy classifications the study only includes the Approved Curriculum and Apprenticeship classifications.

The questionnaire asked the candidates to rate their feeling of how well prepared they were before and after the exam. This may have been difficult for some candidates to rate since there was no standard for comparison. They only had their own perception to base their feeling of preparedness. Another limiting factor was the utilization of the same candidates to rate their perception of preparedness both before and after the test. By necessity ratings for perception before the test were not done until after the test was taken and they may have been influenced by their perceptions established after the test.

Definition of Terms

The following terms have been defined as they were used in this study:

National Athletic Trainer's Association (NATA)

The National Athletic Trainer's Association was formed in 1950 to (Newell, 1966, 3-6) "...advance, encourage, and improve the athletic training profession in all it's phases..."

NATA Approved Curriculum

An NATA Approved Curriculum is a university educational program approved under NATA guidelines. It consists of classwork and clinical experience that will lead to a departmental minor or departmental area of emphasis. The NATA Approved Curriculum will also enable a student to complete criteria to become eligible for NATA certification.

NATA Districts

The NATA has divided the United States and Canada into ten geographical areas to allow for better communication with it's members, and to provide for a democratic and efficient government. The states and provinces classified into districts are as follows:

District 1:	Maine New Hampshire Massachusetts Connecticut Vermont Rhode Island Quebec	District 2:	New York Pennsylvania Delaware New Jersey
District 3:	Maryland North Carolina South Carolina District of Columbia Virginia West Virginia	District 4:	Illinois Indiana Ohio Michigan Wisconsin Minnesota Manitoba Ontario

District 5:	Missouri Iowa Nebraska Kansas North Dakota South Dakota Oklahoma	District 6:	Arkansas Texas
District 7:	Utah Arizona Colorado Wyoming New Mexico	District 8:	California Nevada Hawaii
District 9:	Kentucky Mississippi Florida Tennessee Louisiana Alabama Georgia	District 10:	Alaska Idaho Montana Oregon Washington Alberta British Columbia Saskachewan

Off-Site Oral/Practical

The Off-Site oral/practical is when the candidate takes the oral/practical section of the certification exam at a different site than the written section and on a different date.

On-Site Oral/Practical

The On-Site oral/practical is when the candidate takes the oral/practical section of the certification exam on the same date and at the same site as the written section of the exam.

Professional Examination Service (PES)

The Professional Examination Service is a private service that develops and maintains testing programs for professional organizations. The National Athletic Trainer's

Association has contracted the services of PES to administrate their certification exam program.

Chapter 2

REVIEW OF LITERATURE

This chapter presents an historical overview of the NATA's certification program and the individual members of the NATA who participated in the development of this examination. The involvement of the Professional Examination Service (PES) and their role in the development of the NATA's certification program has also been included.

History

Lindsy McLean wrote (McLean and Westphalen, 1978, 86) that a certification exam, "...would give the association unity of purpose and direction at a time when it was sorely needed...." This statement echoed the feelings of many NATA members as to the positive effects a national certification exam would have on the National Athletic Trainer's Association. The development of a national certification exam was also thought to be helpful in improving the NATA's status as a profession and could give the NATA a tool to standardize competency levels of its members.

In an article entitled "Certification Exam Now in Preparation With PES," McLean (1969, 18) stated the following:

> On December 7, 1968, William E. Newell, Chairman of the Professional Advancement committee of the NATA, appointed a sub-committee to develop a program of certification by evaluation for the NATA.

McLean (1969, 18) citing Newell stated that the purpose of the project was to "...evaluate competency for the safe practice of athletic training...."

The members of the sub-committee worked to determine in more certainty the content and form which the test would take. It was felt that the exam would have little meaning or fail to generate respect from other professions if the test did not achieve a high discrimination value.

To aid the committee with the development of the exam program the Professional Examination Service was contacted. In 1969 a contract was signed between the NATA and PES to develop a national certification exam program.

McLean and Westphalen (1978, 86) describing the progress in the certification program stated,

> After many hours of conversation and comprimize, Joe Altott, Dr. James Feurig, Lindsy McLean, "Bud" Miller, Chris Patrick, and George Sullivan, agreed on the basic format of written and oral/practical tests which has remained valid for seven years, with only minor alterations.

This statement still holds true today. The exam administered is in the original form which includes a written section of 150 multiple choice type questions and a thirty minute oral/practical interview.

Test questions were prepared by some of the most respected members of the NATA. Each participating member

wrote ten questions on topic areas determined by the Certification committee to cover all aspects of the athletic trainer's job. These subject areas were: Anatomy, Physiology, Kinesiology, Physiology of Exercise, Injury Recognition, Therapeutic Modalities, Therapeutic Exercise, and Taping and Bandaging Techniques. Other questions were taken from PES files of pertinent subject matter.

The initial use of the test was in August of 1970, at Waco, Texas. On that first testing date a total of fourteen candidates were administered the certification test. Today, the NATA Certification Exam is given four times annually in January, March, June, and in August. On the January, March, and August testing dates, the exam is administered at approximately nine sites across the United States. The June test is administered at the site of National Convention for that year.

The Professional Examination Service

Since the beginning of the NATA's certification program in 1970, the Professional Examination Service has been responsible for scoring and the maintenance of the questions used on the certification test. When the NATA decided to contract the services of PES, the New York based organization had over forty years experience in preparing and evaluating examinations for professional health care and related fields. Other professional organizations PES prepares examination for include the American Board of Preventitive Medicine,

The American Physical Therapy Association, and The American College of Hospital Administrators.

After the NATA certification examination is administered to a group of candidates, the tests and answer sheets are immediately returned to PES in New York for computer scoring. After being scored, an item analysis is performed on each test question. Each question has an index card on file with PES, complete usage and statistical history is stored on the card. The most important statistic kept on this card is the point biserial correlation coefficient (P-Bis) of each answer alternative. A positive P-Bis is desired of every alternative on the test. A positive P-Bis means that candidates who scored well on the exam chose the correct alternative. A negative P-Bis means that candidates who scored poorly on the exam also chose the correct alternative, thus giving the question low discriminating ability (See Appendix B).

Chapter 3

METHODOLOGY

This study was concerned with surveying certification candidates perception of preparedness for the NATA certification exam. This chapter presents the methods and tools used to obtain the data for this study.

The Subjects

Two hundred subjects were selected randomly from a group of 211 eligible candidates who took the NATA certification exam on the March 15, 1981 testing date at sites across the United States. Each candidate was mailed a questionnaire to assess their feeling of preparedness.

One hundred and forty (seventy percent) of the subjects returned the questionnaire. The sample contained eighty (57.1 percent) males and sixty (42.9 percent) females. Most of the ages of the subjects ranged from twenty to twenty five or older. The age distribution of the subjects has been included in Table one.

Surveying the educational degrees held by the subjects indicated that 104 (74.3 percent) held Bachelor of Arts or Science degrees, thirty (21.4 percent) held Master of Arts or Science degrees, another five (3.6 percent) held

Table 1

Age Distribution of
Survey Candidates

Age	Number of Cases	Percentage
19	0	0
20	0	0
21	17	12.1
22	41	29.3
23	30	21.4
24	12	8.6
25 or older	40	28.6
Totals	140	100.0

Physical Therapy degrees. In addition, 1 (.7 percent) held degrees other than those mentioned above (See Table 2).

Other data collected on the group surveyed indicated that NATA District in which the candidates received the majority of their athletic training education (See Table 3). The distribution was as follows: District 1, 7.1 percent, District 2, 20.7 percent; District 3, 12.1 percent; District 4, 24.3 percent; District 5, 10 percent; District 6, 6.7 percent; District 7, 2.9 percent; District 8, 5 percent; District 9, 3.6 percent; and District 10, 7.1 percent.

The Questionnaire

The questionnaire used in this study was constructed to determine the feeling of the candidates about their preparation for the nine different subject areas tested on the NATA certification exam (See Appendix C). The candidates were asked to rate their feeling of preparedness before they took the exam, and then rate their feeling after they took the exam.

The first five questions of the questionnaire were demographic in nature, and were used for describing the subjects used in the study (See Appendix B). The following are the nine subject areas included on the certification exam that are considered essential by the NATA to perform as certified trainers: Anatomy, Physiology, Kinesiology, Physiology of Exercise, Injury Recognition, First Aid Procedures, Therapeutic Modalities, Therapeutic Exercise,

Table 2

Distribution of Educational Degrees
Held by Survey Candidates

Degree	Number of Cases	Percentage
Bachelor of Arts or Science	104	74.3
Master of Arts or Science	30	21.4
Physical Therapy	5	3.6
Doctorate	0	0
Other	1	.7
Total	140	100.0

Table 3

Distribution of Candidates by NATA District of Athletic Training Experience

District	Number of Cases	Percentage
1	10	7.1
2	29	20.7
3	17	12.1
4	34	24.3
5	14	10
6	10	7.1
7	4	2.9
8	7	5
9	5	3.6
10	10	7.1
Total	140	100.0

and Supportive Taping and Bandaging Techniques. Questions six through fourteen asked the certification candidates to rate their feeling of preparedness in each of the subject areas before and after the exam. The potential responses on the scale for each question were poor, below average, average, above average, and superior.

Questions fifteen through seventeen asked the candidates to respond to the option of the oral/practical section of the exam in which they participated. They were also asked to respond to possible reasons for their choice.

Procedure

A list of the certification candidates for the March 15, 1981 testing date was obtained from the NATA Board of Certification, this list included mailing addresses for all candidates. Agreement was established that the candidates would only be contacted on this project by a questionnaire.

The selected subjects were mailed the questionnaire, a self-addressed stamped envelope, and a cover letter with instructions for completing the questionnaire and returning it. The questionnaires were sent on April 2, 1981, and the subjects were asked to return it by April 11, 1981, or as near to that date as possible.

Analysis of the Data

The information on the returned questionnaires were transferred to IBM computer cards for analysis. Frequency distribution of the responses was computed on the IBM computer at Eastern Illinois University. The t-test for correlated data programed for the Statistical Package for the Social Sciences (SPSS) was used to analyze the data at the .05 level of significance.

Chapter 4

ANALYSIS OF THE DATA

The purpose of this study was to determine if there was a difference in how National Athletic Trainer's Association certification candidates felt they were prepared in the nine subject areas tested on the NATA certification examination before and after taking the test. Male and female candidates from both the Apprenticeship and Approved Curriculum routes for becoming qualified for certification were analyzed in this study. A seventeen item questionnaire was used to collect the data.

Results of Apprenticeship Candidates

The results of the analysis performed on the Apprenticeship program classification data, revealed there was a significant difference ($p \leq .05$) in the candidates' perception of their preparation before and after taking the test for the subject areas of Anatomy, Physiology, Kinesiology, Physiology of Exercise, Injury Recognition, First Aid Procedures, Therapeutic Modalities and Supportive Taping and Bandaging Techniques. The Apprenticeship program candidates did not show a significant difference in the area of Therapeutice Exercise ($p > .05$). The candidates

felt less prepared in the other eight subject areas after taking the test.

Table four depicts the number of responses for each choice and Table five shows the mean scores, standard deviation, and t-scores for the perception of preparation before and after the examination.

Results of Approved Curriculum Candidates

Seventy two candidates responded to the Approved Curriculum program classification. Table six depicts responses in the nine areas, Table seven presents the mean scores, standard deviation, and t-scores for perception of preparedness both before and after the test for the Approved Curriculum group. There were no significant differences in the candidates' feelings of preparedness in the areas of Physiology and Therapeutic Modalities ($p > .05$).

The Approved Curriculum candidates differed significantly ($p \leq .05$) in their feelings of preparedness in the areas of Anatomy, Kinesiology, Physiology of Exercise, Injury Recognition, First Aid Procedures, Therapeutic Exercise and Supportive Taping and Bandaging before and after the test. This indicated a lower feeling of preparedness after taking the certification test.

Results of Male Candidates

The analysis of the responses of the eighty male candidates was performed as in the previous results and

Table 4

Preparedness Responses of Apprenticeship Program Candidates

		Responses				
		1 poor	2 below average	3 average	4 above average	5 superior
Subjects						
Anatomy	B	0	0	19	35	10
	A	1	7	22	27	7
Physiology	B	1	4	31	22	6
	A	1	13	27	18	4
Kinesiology	B	0	9	23	23	9
	A	1	11	27	17	7
Physiology of Exercise	B	1	6	22	30	5
	A	3	9	24	24	4
Injury Recognition	B	0	2	15	27	20
	A	1	5	18	24	16
First Aid Procedures	B	1	0	7	26	30
	A	2	0	11	26	26
Therapeutic Modalities	B	1	9	16	29	9
	A	2	11	18	29	4
Therapeutic Exercise	B	1	3	26	30	4
	A	4	6	23	24	7
Supportive Taping and Bandaging	B	1	1	7	25	30
	A	2	2	11	23	26

B = Before
A = After

Table 5

Comparison of Mean Scores of Perception of Preparation by Subject Area Before and After Testing 63 NATA Apprenticeship Candidates

	Before		After		
Subject	M	SD	M	SD	t-score
Anatomy	3.86	.663	3.48	.943	3.72*
Physiology	3.43	.814	3.12	.968	2.87*
Kinesiology	3.50	.909	3.23	1.020	2.33*
Physiology of Exercise	3.50	.836	3.25	.992	2.90*
Injury Recognition	4.01	.826	3.75	1.024	2.79*
First Aid Procedures	4.31	.794	4.12	.984	2.35*
Therapeutic Modalities	3.56	.957	3.32	.993	2.65*
Therapeutic Exercise	3.51	.756	3.35	1.060	1.64
Supportive Taping and Bandaging	4.28	.845	4.06	1.052	2.07*

*$p \leq .05$

Table 6

Preparedness Responses of Approved Curriculum Candidates

		Responses				
		1 poor	2 below average	3 average	4 above average	5 superior
Subjects						
Anatomy	B	1	1	15	38	17
	A	1	8	25	28	10
Physiology	B	1	8	30	25	8
	A	1	10	36	18	7
Kinesiology	B	0	8	25	29	10
	A	1	9	31	24	7
Physiology of Exercise	B	0	5	28	27	12
	A	2	6	33	20	11
Injury Recognition	B	1	0	8	41	22
	A	0	3	13	41	15
First Aid Procedures	B	0	0	12	31	29
	A	0	2	15	35	20
Therapeutic Modalities	B	1	2	26	31	12
	A	1	2	27	32	10
Therapeutic Exercise	B	1	2	26	29	14
	A	1	9	26	25	11
Supportive Taping and Bandaging	B	0	1	9	31	31
	A	0	1	12	34	25

B = Before
A = After

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Table 7

Comparison of Mean Scores of Perception of Preparation by Subject Area Before and After Testing of 72 NATA Approved Curriculum Candidates

	Before		After		
Subject	M	SD	M	SD	t-score
Anatomy	3.94	.854	3.51	.964	4.89*
Physiology	3.43	.885	3.27	.876	1.95
Kinesiology	3.56	.869	3.37	.879	3.17*
Physiology of Exercise	3.63	.844	3.44	.948	2.77*
Injury Recognition	4.15	.725	3.94	.748	2.93*
First Aid Procedures	4.23	.722	4.01	.778	3.51*
Therapeutic Modalities	3.70	.830	3.66	.805	.49
Therapeutic Exercise	3.73	.856	3.50	.949	2.85*
Supportive Taping and Bandaging	4.27	.736	4.15	.744	2.00*

*$p \leq .05$

the data have been presented in Table eight. Significant differences were found in the Male candidates' perception of their preparedness in all nine subject areas before and after taking the test as depicted in Table nine ($p \leq .05$).

Results of Female Candidates

Tables ten and eleven presents the data collected on the sixty female candidates who participated in this study. Analysis of the data indicated there were significant differences ($p \leq .05$) in this group's feeling of preparedness before and after taking the certification exam in the subject areas of Anatomy, Physiology, Kinesiology, Physiology of Exercise, First Aid Procedures, and Therapeutic Exercise. The significant scores indicate a lower perception of preparedness after the test.

Table eleven shows there was no significant difference ($p > .05$) in the candidates' feelings of preparedness both before and after the test in the subject areas of Injury Recognition, Therapeutic Modalities, and Supportive Taping and Bandaging Techniques.

Results of the On-Site Oral/Practical

The candidates were asked to respond to which option of the oral/practical they chose. One hundred and twenty (85.7 percent) candidates chose the On-Site option. Responding to possible reasons for their preference of the On-Site oral/practical, 103 (73.6 percent) candidates felt

Table 8

Preparedness Responses of
Male Candidates

		Responses				
		1 poor	2 below average	3 average	4 above average	5 superior
Subjects						
Anatomy	B	0	0	18	49	13
	A	1	8	27	33	11
Physiology	B	0	8	31	29	12
	A	2	11	35	23	9
Kinesiology	B	0	11	25	31	13
	A	1	14	30	24	11
Physiology of Exercise	B	1	4	30	24	11
	A	3	8	33	27	9
Injury Recognition	B	0	0	12	39	29
	A	0	1	18	41	19
First Aid Procedures	B	0	0	8	37	35
	A	1	1	11	41	26
Therapeutic Modalities	B	0	6	23	37	14
	A	1	9	26	35	9
Therapeutic Exercise	B	0	2	27	36	15
	A	2	4	27	32	15
Supportive Taping and Bandaging	B	0	1	7	30	42
	A	1	0	15	30	34

B = Before
A = After

Table 9

Comparison of Mean Scores of Perception of Preparation by Subject Area Before and After Testing 80 Male NATA Certification Candidates

	Before		After		
Subject	M	SD	M	SD	t-score
Anatomy	3.93	.623	3.55	.940	4.40*
Physiology	3.56	.869	3.31	.976	2.78*
Kinesiology	3.57	.925	3.36	1.009	2.40*
Physiology of Exercise	3.62	.832	3.37	.986	3.27*
Injury Recognition	4.21	.688	3.93	.847	3.75*
First Aid Procdures	4.33	.655	4.11	.842	3.38*
Therapeutic Modalities	3.73	.838	3.51	.928	2.90*
Therapeutic Exercise	3.80	.770	3.66	.967	2.01*
Supportive Taping and Bandaging	4.41	.706	4.18	.887	2.76*

*$p \leq .05$

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Table 10

Preparedness Responses of
Female Candidates

		Responses				
		1 poor	2 below average	3 average	4 above average	5 superior
Subjects						
Anatomy	B	1	1	16	26	16
	A	1	7	20	24	8
Physiology	B	2	4	30	21	3
	A	1	12	28	16	3
Kinesiology	B	0	6	23	23	8
	A	2	6	28	19	5
Physiology of Exercise	B	0	7	21	26	6
	A	2	7	25	20	6
Injury Recognition	B	1	2	12	32	13
	A	0	7	14	27	12
First Aid Procedures	B	1	0	12	22	25
	A	1	1	16	21	21
Therapeutic Modalities	B	2	5	19	24	10
	A	2	4	19	27	8
Therapeutic Exercise	B	2	3	25	24	6
	A	3	11	22	18	6
Supportive Taping and Bandaging	B	1	1	12	27	19
	A	1	3	10	29	17

B = Before
A = After

Table 11

Comparison of Mean Scores of Perception of Preparation by Subject Area Before and After Testing 60 Female NATA Certification Candidates

	Before		After		
Subject	M	SD	M	SD	t-score
Anatomy	3.90	.933	3.50	.983	4.18*
Physiology	3.31	.813	3.13	.853	2.03*
Kinesiology	3.55	.857	3.31	.892	2.91*
Physiology of Exercise	3.51	.833	3.35	.936	2.32*
Injury Recognition	3.90	.838	3.73	.918	1.86
First Aid Procedures	4.16	.867	4.00	.921	2.32*
Therapeutic Modalities	3.58	.979	3.58	.926	0
Therapeutic Exercise	3.48	.873	3.21	1.027	2.46*
Supportive Taping and Bandaging	4.03	.863	3.96	.901	.81

*$p \leq .05$

the On-Site oral/practical was more convenient for them, nine (6.4 percent) felt they would be more comfortable with the thirty minute time limit, and eight (5.7 percent) chose the On-Site for other reasons.

Results of the Off-Site Oral/Practical

Twenty (14.3 percent) of the 140 candidates who participated in this study chose the Off-Site oral/practical option. Responses for their choice were as follows: fifteen (10.7 percent) felt the less pressured atmosphere would be more comfortable for them, three (2.1 percent) felt discussion of their answers would be more beneficial, and two (1.4 percent) chose the Off-Site option for other reasons.

Discussion of the Findings

A complete look at the results of this study revealed that all candidates had a significantly lower feeling of preparedness after taking the NATA certification examination in the subject areas of Anatomy, Kinesiology, Physiology of Exercise and First Aid Procedures ($p \leq .05$).

The Female candidates did not show significant changes in perception of preparation before and after taking the test in the areas of Injury Recognition, Therapeutic Modalities, and Supportive Taping and Bandaging Techniques ($p > .05$).

Apprenticeship candidates showed no significant change in perception of preparation in the area of

Therapeutic Exercise, and the Approved Curriculum group who showed no significant difference in the area of Therapeutic Modalities.

Male candidates were the only group that showed a significant difference ($p \leq .05$) in perception of preparation after taking the test in all nine subject areas. These significant t-scores indicate the candidates had a lower feeling of preparedness after the examination.

Results of the Oral/Pratical option in which certification candidates chose to participate, the data clearly indicated that candidates felt the convenience of taking both sections of the exam (written and oral/practical) on the same day and at the same site was desirable.

The mean scores for both before and after perceptions of preparation were in the average and above average categories as evidenced by the frequencies presented. The after responses tended to be somewhat lower than the before responses, but the group still perceived their preparation to be average or above average.

Chapter 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Chapter five includes a summary of this study, including the purpose, methodology, conclusions, and recommendations.

Summary

The candidates for NATA certification are required to complete an examination to show proficiency in the areas of Anatomy, Physiology, Kinesiology, Physiology of Exercise, Injury Recognition, First Aid Procedures, Therapeutic Modalities, Therapeutic Exercise, and Supportive Taping and Bandaging Techniques. The purpose of this study was to determine how the candidates perceived their academic preparation in each of the above areas both before and after taking the test.

A seventeen item questionnaire was sent to 200 certification candidates who had taken the NATA certification exam on March 15, 1981, at nine sites in the United States. One hundred and forty (70 percent) of the questionnaires were returned for analysis.

Conclusions

Based on the findings of this study the following conclusions are offered:

1. The candidates from both the Approved Curriculum and Apprenticeship groups changed their perception of preparation to a lower value in the areas of Anatomy, Kinesiology, Physiology, Physiology of Exercise, Injury Recognition, First Aid Procedures, and Supportive Taping and Bandaging Techniques, after taking the test.

2. The candidates from the Apprenticeship and Approved Curriculum groups did not perceive any difference in preparation before and after the test in the subject areas of Therapeutic Exercise and Therapeutic Modalities respectively.

3. Male candidates expressed a lower perception of their preparation in all subject areas after they had taken the test.

4. Female candidates felt less prepared after the test in all subject areas except Therapeutic Modalities, and Supportive Taping and Bandaging Techniques.

5. The candidates selected the On-Site oral/practical because it was more convenient than the Off-Site option.

6. The candidates rated their perception of preparedness more frequently in the average and above average categories both before and after.

Recommendations

Due to the experience in this study the following recommendations are made:

1. Further study of this problem is recommended using improved methodology and procedures. In future studies it is recommended that two independent groups be used to respond to the questionnaire before and after the test.

2. A study should be completed with a modified design for the responses to the questionnaire. Fewer categories of perception may allow other statistical procedures to be applied.

BIBLIOGRAPHY

Davis, Otho 1973. "Current Sports Medicine Issues," Annual Safety Education Review, February 1973.

Downie, and Heath 1959. Basic Statistical Methods (New York: Harper and Row).

McLean, J. Lindsy 1969. "Certification Exam Now in Preparation With PES," The Journal of the NATA, Winter 1969.

_____ and S. Westphalen 1978. "Seven Years of Certification by the NATA," Athletic Training, Summer 1978.

Newell, William E. 1966. "Your Association and It's Programs," The Journal of the NATA, Summer 1966.

APPENDIX A

NATIONAL ATHLETIC TRAINERS' ASSOCIATION PROCEDURES FOR CERTIFICATION

REVISED: August 1980

TO BECOME CERTIFIED AS AN ATHLETIC TRAINER BY THE NATIONAL ATHLETIC TRAINERS' ASSOCIATION, AN INDIVIDUAL MUST MEET THE REQUIREMENT IN ONE OF THE FOLLOWING SECTIONS I, II, III, OR IV. QUALIFICATION IN MORE THAN ONE SECTION IS NOT REQUIRED.

SECTION I. CURRICULUM - Students who have graduated from an approved undergraduate or graduate program, who have met the following criteria:

1. Completion of the NATA approved athletic training curriculum requirements, and proof of a bachelor's degree from an accredited college or university.

2. Have spent a minimum of 800 clock hours over a minimum of two (2) years and not more than four (4) years under the direct supervision of NATA approved clinical instructors. No more than 400 clock hours can be counted in any one year.

3. Presentation of Competency Evaluation Checklist from a certified athletic trainer.

4. Proof of one (1) year of continuous Associate or Student membership in NATA immediately prior to application for certification.

5. Proof of certification in Standard First Aid and CPR (Basic Rescuer) (or equivalent).

6. Pass an examination which includes basic principles of athletic training. (NATA Certification Examination).

A person who is once certified under these procedures remains certified as long as he/she meets the minimum requirements for continuing professional education as defined by the Professional Education Committee as approved by the Board of Directors and only as long as such requirements are met and maintains continuous Certified Membership.

SECTION II. APPRENTICESHIP - Students of Athletic Training may qualify for certification by:

1. On the job training while enrolled as a full time student (minimum 1800 hours) over a minimum of two (2) years and not more than six (6) years under the direct supervision of a certified NATA member. (All hours must be documented.)

2. Proof of a bachelor's degree from an accredited college or university.

3. Presentation of a Competency Evaluation Checklist by his/her immediate NATA certified supervisor.

4. Presentation of a letter of recommendation from an NATA certified athletic trainer.

5. Presentation of a letter of recommendation by his/her acting team physician.

6. Proof of one (1) year of continuous Associate or Student membership in NATA immediately prior to application for certification.

7. Proof of current certification in Standard First Aid and CPR (Basic Rescuer) (or equivalent).

8. Pass an examination which includes basic principles of athletic training. (NATA Certification Examination).

A person who is once certified under these procedures remains certified as long as he/she meets the minimum requirements for continuing professional education as defined by the Professional Education Committee as approved by the Board of Directors and only as long as such requirements are met and maintains continuous Certified Membership.

SECTION III. SPECIAL CONSIDERATION - This section deals with athletic trainers actively engaged within the profession but not yet certified.

The NATA definition of "actively engaged" is as follows: A person who is on a salary basis (no fee) employed by an educational institution, professional athletic organization or other bonafide athletic organization for the duration of the institution's school year or for the length of the athletic organization's season and who performs the duties of athletic trainer as a major responsibility of his/her employment; or whose responsibility is the teaching in an NATA approved athletic training curriculum is actively engaged in athletic training.

A person may be granted certification by special consideration by:

1. Proof of five (5) years of athletic training experience, after college graduation on the undergraduate level, provided that it would meet the minimum of one of the following requirements:

   (a) graduate of an NATA approved faculty-trainers educational program;

   (b) a minimum of one (1) year apprenticeship (800 hours) directly under a certified athletic trainer; or

   (c) providing proof of essentially equivalent academic course work requirements to that of an NATA approved curriculum graduate. (If this method is selected, the applicant must submit his/her academic transcripts a minimum of 12 months prior to the anticipated date of examination for evaluation and approval.)

2. Proof of graduation from an accredited four your college of university.

3. Presentation of a Competency Evaluation Checklist from an NATA certified athletic trainer.

4. Presentation of a letter of recommendation from an NATA certified athletic trainer.

5. Presentation of a letter of recommendation by his/her acting team physician.

6. Proof of one (1) year of continuous Associate membership in NATA immediately prior to application for certification.

7. Proof of current certification in Standard First Aid and CPR (Basic Rescuer) (or equivalent).

8. Pass an examination which includes basic principles of athletic training. (NATA Certification Examination).

A person who is once certified under these procedures remains certified as long as he/she meets the minimum requirements for continuing professional education as defined by the Professional Education Committee as approved by the Board of Directors and only as long as such requirements are met and maintains continuous Certified Membership.

SECTION IV. PHYSICAL THERAPY DEGREE GRADUATE - Physical Therapy graduates may be awarded certification provided they meet the following requirements:

1. Having spent a minimum of 800 clock hours* over a minimum of two (2) years and not more than four (4) years under the direct supervision of an actively engaged certified athletic trainer beyond that as a student athletic trainer on the secondary school level. No more than 400 clock hours can be counted in any one year. (All hours must be documented.)

2. Proof of a bachelor's degree from an accredited college or university.

3. Presentation of a Competency Evaluation Checklist from a certified athletic trainer.

4. Presentation of a letter of recommendation from an NATA certified athletic trainer.

5. Presentation of a letter of recommendation by his/her acting team physician.

6. Proof of one (1) year of continuous Associate or Student membership in NATA immediately prior to application for certification.

7. Proof of current certification in Standard First Aid and CPR (Basic Rescuer) (or equivalent).

8. Pass an examination which includes basic principles of athletic training. (NATA Certification Examination).

*Refer to the NATA Board of Certification Competency Evaluation Checklist for Athletic Training Techniques with major emphasis on Sections I, II, IV and V.

A person who is once certified under these procedures remains certified as long as he/she meets the minimum requirements for continuing professional education as defined by the Professional Education Committee as approved by the Board of Directors and only as long as such requirements are met and maintains continuous Certified Membership.

APPENDIX B

GUIDE FOR THE INTERPRETATION OF ITEM ANALYSIS DATA

Professional Examination Service
475 Riverside Drive
New York, New York 10027

January, 1978

Appendix B (Continued)

This guide explains the statistics used in item analysis and illustrates how item analysis information can be used in the decision making process to construct examinations which are both content valid and reliable.

Following the administration of a test form to a sufficient sample of candidates, item analysis is routinely performed. The resulting data are printed out in book form for the test as a whole, and individually for each item, to be mounted on the back of the 5" x 8" card for that item. Every time an item analysis is run including a particular item, those data are added to the card. Thus, each 5" x 8" card for an item contains the complete usage and statistical history of that item.

Each item analysis and item card contains the following information (reading from left to right):

1. Accession Number: The unique identifying number assigned to an item by the Professional Examination Service.

2. Answer: Indicates the number of the choice which has been keyed as the correct answer to the question.

3. Item Number: Indicates the number of the item in the examination.

4. Choices: Lists the numbers of the choices for each item (followed by item statistics). The correct answer is marked with an asterisk (*). The number 0 is used for omitted answers or answers voided because more than one choice was made. The correct choice is printed twice, once in its correct order and, again, one space below choice "0."

5. Percent: Indicates the percentage of examinees selecting each choice in the item. The percent selecting the correct choice is called the difficulty of an item. It shows what percent of the examinees taking the test correctly answered the question. Note that this number goes up as the item gets easier (more candidates get it right).

5. P Bis: The point biserial correlation coefficient. This is given for each choice of an item. The point biserial correlation is an indication of the overall relationship between score performance on the total test or a part and responses to the item. If the p bis is positive for a choice, it means that high-scoring candidates tended to choose that choice and low-scoring candidates did not. If it is negative, it means that high-scoring candidates

Appendix B (continued)

tended not to select the choice, while low-scoring candidates did choose it. The correct choice should have a positive p bis, while incorrect choices (called distractors) should have a negative p bis. The p bis is considered a discrimination index, since it indicates how well the item helps to distinguish between more able and less able candidates. The greater the magnitude of the p bis, the better the choice is discriminating. When interpreting the p bis, it is useful to note the significance of the correlation. This is indicated by * or II following the p bis for each choice. This is a measure of the likelihood of obtaining a coefficient of this magnitude by chance alone if no correlation actually existed. One asterisk indicates "significance at the .05 level," that is, the correlation could have been obtained by chance in 5 out of 100 times, while two asterisks (.01 level) indicate that it could have been obtained in only 1 out of 100 times. The .01 level indicates a stronger relationship than the .05 level.

7. Mean: Indicates the average total raw score on the whole test of the examinees selecting a particular choice. These data provide a further indication of an item's discriminatory power, since the correct choice should have the highest mean associated with it, indicating high-scorers tended to choose that option.

Some Examples

The following examples are illustrations of the types of problems encountered in the interpretation of item analysis data. It is hoped that these examples will answer some of the questions that often arise when item analyses are examined.

Example 1

Accession No.	Ans.	Item No.	Choices	Percent	P Bis	Mean
K 105283	3	44	1	0.3	-0.117**	211.50
			2	2.7	-0.194**	248.56
			3*	65.7	0.396**	303.53
			4	12.7	-0.164**	276.36
			5	18.6	-0.246**	273.19
			0	0.0	0.0	0.0
			3*	65.7	0.396**	303.53

Appendix B (Continued)

This is an example of a good item. The discriminatory power of the item, that is, the p bis for the correct answer (choice #3, indicated by the *), is positive and significant at the .01 level (note "**" directly following the correlation), while the distractors all have significant negative correlations. Notice that the "Mean" column indicates that candidates selecting the correct response obtained, on the average, a higher score than those selecting the one of the other choices.

Example 2

Accession No.	Ans.	Item No.	Choices	Percent	P Bis	Mean
K 116828	3	55	1	1.2	-0.102**	257.63
			2	22.3	-0.066	287.99
			3*	46.9	0.070	295.49
			4	22.9	-0.049	289.29
			5	6.6	0.099**	306.82
			0	0.1	-0.002	291.00
			3*	46.9	0.070	295.49

This item is more difficult than the previous example (difficulty level = 46.9%, indicating less than half of the candidates selected the correct response). The problem with this item is that it is a weak discriminator. The p bis for the correct response (.070) is not significant, while choice #5, which should have a negative p bis, shows a significant positive correlation. This indicates that some of the strongest candidates are choosing this as the correct response. Only response #1 is "doing its job" of attracting the poorer candidates, that is, the correlation is negative and significant at the .01 level.

Example 3

Accession No.	Ans.	Item No.	Choices	Percent	P Bis	Mean
K 97905	1	61	1*	85.5	0.130**	294.71
			2	3.4	-0.082*	276.26
			3	0.0	0.0	0.0
			4	9.3	-0.076**	283.69
			5	1.8	-0.065	274.33
			0	0.0	0.0	0.0
			1*	85.5	0.130**	294.71

Appendix B (Continued)

The correct choice in this item is discriminating appropriately (.130**). However, a problem with this item is that none of the candidates selected choice #3. The item becomes, in effect, a four-choice question. This points to the need for some type of revision for this distractor.

Example 4

Accession No.	Ans.	Item No.	Choices	Percent	P Bis	Mean
K 130391	1	154	1*	42.1	-0.014	292.08
			2	15.4	-0.056	287.68
			3	3.6	0.033	286.13
			4	20.2	0.001	292.79
			5	18.3	0.100**	300.73
			0	0.4	-0.090*	242.00
			1*	42.1	-0.014	292.08

This item shows serious problems and would require extensive revision. The correct response (choice #1) has a negative, non-significant p bis correlation, while option #5 has a significantly positive p bis. In addition, choice #4 is drawing 20% of the candidates, but the p bis is close to zero, indicating no discrimination between high and low scorers.

When an item has been used on several examinations (as indicated by more than one set of statistical data on the 5" x 8" item card) it is best to use the most recent data in assessing the effectiveness of an item, since candidate groups and the content emphasis of an examination change over time.

NOTE: The display format for item analyses conducted prior to 1975 is slightly different from that described above. These contain the data for the correct response only. The format of the information and its interpretation remain the same, however.

Constructing the Examination

When considering the construction of the total examination a number of useful guidelines can be provided in how item analysis data, when combined with careful content inspection, can be used to develop reliable examinations. If an item's content is appropriate, the next consideration should be whether the item is discriminating between high and low

Appendix B (Continued)

scorers. This is, of course, accomplished by examining the p bis correlation coefficients for the choices. If items with significant point biserials are selected the test's reliability will be improved. With regard to the item difficulty, or percent of candidates selecting the correct choice, a range of items with varying difficulty should be selected. However, as is common in many licensing and certification testing situations, usually only poorly performing candidates are being "weeded out." This suggests that it is optimal to select on the final test form a greater proportion of items that are somewhat less difficult (that is, difficulty above .50). However, the content and the discrimination of the item should be the primary considerations.

APPENDIX C

March 9, 1981

Dear Certification Candidate:

The questionnaire you have received is to be used to complete my thesis project dealing with how well certification candidates feel they have been prepared to take the N.A.T.A. National Certification Exam. I would be greatly appreciated if you will complete the questionnaire and return it to me in the enclosed envelope prior to April 11, 1981.

Please be assured that your participation will be held in complete confidence, as I have not coded the questionnaire for identification in anyway. I have also given written assurance to the N.A.T.A. Board of Certification that you will not be contacted further in relation to this project without the Board's approval.

Your participation is crucial to the success of this project, and will be greatly appreciated if the questionnaire is answered as accurately as possible then returned promptly.

Thank you for your time and participation.

Sincerely,

Richard J. Lloyd

Richard J. Lloyd
Graduate Assistant
Eastern Illinois University

Appendix C (Continued)

N.A.T.A. Certification Exam Survey

1. Please check your age.

____ 1. 19 years old

____ 2. 20 years old

____ 3. 21 years old

____ 4. 22 years old

____ 5. 23 years old

____ 6. 24 years old

____ 7. 25 years or older

2. Please check your sex.

____ 1. Male

____ 2. Female

3. Please check your level of education as of June 1, 1981.

____ 1. B.A. or B.S.

____ 2. M.A. or M.S.

____ 3. P.T.

____ 4. Doctorate

____ 5. Other

4. Please check the one N.A.T.A. district from which you receive the majority of your athletic training education.

____ 1. District #1

____ 2. District #2

____ 3. District #3

____ 4. District #4

____ 5. District #5

____ District #6

____ District #7

____ District #8

____ District #9

____ District #10

Appendix C (Continued)

5. Please check the option in which you complete the N.A.T.A. requirements to become eligible for certification.

____ 1. Apprenticeship program

____ 2. Special consideration

____ 3. N.A.T.A. approved curriculum program

____ 4. Physical therapy

On the following items (questions 6 through 14), rate your feeling of preparedness BEFORE taking the exam in the first column, and your feeling of preparedness AFTER taking the exam in the second column. Please rate your feelings of preparedness according to the scale below. Please circle your scale number.

1	2	3	4	5
Poor	Below Average	Average	Above Average	Superior

BEFORE	AFTER		
1 2 3 4 5	1 2 3 4 5	6.	How well prepared were you in the area of Anatomy?
1 2 3 4 5	1 2 3 4 5	7.	How well prepared were you in the area of Physiology?
1 2 3 4 5	1 2 3 4 5	8.	How well prepared were you in the area of Kinesiology?
1 2 3 4 5	1 2 3 4 5	9.	How well prepared were you in the area of Physiology of Exercise?
1 2 3 4 5	1 2 3 4 5	10.	How well prepared were you in the are of Injury Recognition?
1 2 3 4 5	1 2 3 4 5	11.	How well prepared were you in the are of First Aid Procedures?
1 2 3 4 5	1 2 3 4 5	12.	How well prepared were you in the are of Therapeutic Modalities?
1 2 3 4 5	1 2 3 4 5	13.	How well prepared were you in the area of Therapeutic Exercise?
1 2 3 4 5	1 2 3 4 5	14.	How well prepared were you in the area of Supportive Taping and Bandaging Techniques?

Appendix C (Continued)

15. Please check the option of the Oral-Practical section of the exam you chose.

____ 1. On-Site (go to question 16)

____ 2. Off-Site (go to question 17)

16. If you marked the On-Site option, please check the one choice that most influenced your decisions.

____ 1. The On-Site was more convenient for you.

____ 2. You would have had difficulty in acquiring the materials required for Off-Site testing.

____ 3. You felt more comfortable with the time limit for On-Site testing.

____ 4. Other reasons.

17. If you marked the Off-Site option, please check the one choice that most influenced your decision.

____ 1. The Off-Site testing was more convenient for you.

____ 2. You felt more comfortable with the less pressured atmosphere of the Off-Site testing.

____ 3. You felt that discussion of your answers would be more beneficial to you.

____ 4. Other reasons.

VITA

Richard Jon Lloyd was born December 21, 1957 in Niagara Falls, New York. He lived in Youngstown, New York and attended Lewiston-Porter Senior High School until the time of high school graduation. After graduation he entered Ball State University, where he majored in Physical Education and Minored in Athletic Training. Upon graduation from college in May of 1980, he was accepted into the graduate school at Eastern Illinois University, and received a graduate assistantship from the Physical Education Department and served as an athletic trainer in the intercollegiate sports program.